



# Ø BEAT

COLO. SPRINGS,  
COLORADO

AUG 1969

## BURT BITTNER, ANTENNA EXPERT, TO SPEAK AT AUGUST MEETING

Burt Bittner, KØWQN, considered one of the top experts in the theory, design and construction of antennas, will be the speaker at the August 13 meeting of the PPRAA, at the U. S. Naval Reserve Training Center, Lake and Logan Sts., starting at 7:30 p. m.

Burt will speak on long-long antenna systems and discuss antennas for frequencies from very low frequencies to very high frequencies. He will give a demonstration of signals from VLF stations and provide some listening to VLF signals rarely heard by Radio amateurs.

One of the top employees at Command Nuclear here in Colorado Springs, Burt has been a frequent speaker at radio clubs in Colorado and in Oklahoma City before the Aeronautical Center Amateur Radio Club.

He was one of the speakers at the Rocky Mountain Division, ARRL, Convention here in Colorado Springs in 1966.

He is the author of a recent article in QST on the corona effect on mobile antennas and doubtless will be ready to answer any questions on antennas for fixed or mobile radio transmitting and receiving.

Don't miss this interesting meeting!!

## ED POMPEA ELECTED VICE PRESIDENT, FRANK CRAW NEW BOARD MEMBER

Ed Pompea, KØZPG, was elected vice president of the PPRAA and Frank Craw, WØHWH, was elected as a member of the PPRAA Board of Directors to fill the vacancies created by the departure of George Kowalski, WØGCH, from the Colorado Springs area.

Ed, who has been an active member of the PPRAA for some time, is a former PPRAA treasurer. Frank is now on his fourth year as editor of Zero Beat.

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## AUCTION, ELECTION OF OFFICERS SET FOR SEPTEMBER, OCTOBER MEETS

The September meeting of the PPRAA will be an auction night, so you have plenty of time to get together two things---those pieces of equipment you'd like to dispose of and the "green stuff" with which to latch on to some of the "goodies" offered for sale at the auction. More about the auction will appear in next month's Zero Beat.

The October meeting will be the official annual meeting of the club, at which time elections will be held.

## ZERO BEAT

Published monthly, in the interest of the members of the Pikes Peak Radio Amateur Ass., Inc., Colorado Springs, Colo.

Clarence (Frank) Crow, WØHWH, Editor  
Telephone 635-3373

Address all items and exchanges to: 1142  
Rainier Drive, Colorado Springs, 80910

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The PPRAA meets the second Wednesday of each month in the U. S. Naval Reserve Training Center, Lake and Logan Streets, starting at 7:30 p. m. All radio amateurs and other interest persons are invited to attend. Secretary's address: 2018 W. Uintah St., Colorado Springs, Colo. 80904.

COPY DEADLINE FOR SEPTEMBER ZERO BEAT will be August 27.

Editorial

## LET'S INFORM OUR LEGISLATORS

It is quite evident that this year's state legislators suffer from one of three 'maladies' ---a lack of awareness of what services have been rendered in this state by amateur radio operators; a lack of appreciation for what the amateur radio operators in this state have done and can do in furnishing communications in case of emergencies; or the inability to resist the seeming desire of the state Revenue Department to get everything out of everybody possible in some form of taxes.

Whichever malady it is they suffered from this year, it has resulted in an extra cost to amateur radio operators who desire call letter plates for their vehicles---an increase from one dollar to five dollars in addition to the regular license fee (which, incidentally, has also been raised).

This shortsightedness was not apparent with the legislators of the state of Alaska, whose action in encouraging amateur radio operators to equip for emergency use is related in a letter from KL7FPA which appeared in June QST and is reprinted elsewhere in this issue of Zero Beat.

It seems that a program of protest and education for the Colorado legislators is called for---a protest against the raise in fees for a group which stands ready to donate their time and equipment during natural disasters and other emergencies, and an educational campaign to make these legislators aware of

## BOARD OF DIRECTORS

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-0-

what we have done and what we can do in case of emergencies.

The Alaskan legislators showed their understanding of the part amateur radio played in emergencies and "natural disasters." And such "natural disasters" can and have happened here---witness the 1965 flood and times residents of the state had been isolated by heavy snowstorms. And among the "emergencies" in this state have been the many lost airplanes, and in at least one case local hams helped provide communications for the CAP during a search.

It seems that whenever we handle messages for a third party, especially traffic from our servicemen in Vietnam or elsewhere when we provide communications in case of an emergency or disaster---a little bit of spade work directed to the legislators of this state is in order.

The 47th General Assembly Bulletin says:

"Can the citizen influence legislation?

Very Definitely.

"Any citizen can come to see any Senator or Representative or write him a letter outlining his views on a measure under consideration. He can appear before committees to give his views on bills. However, is he is attempting to influence legislation for other he must register as a 'lobbyist.'

"The opinions of individual citizens are most important to all legislatures. Members of the General Assembly are usually well in-

(Continued on next page)

## LET'S INFORM OUR LEGISLATORS

(Continued from preseding page)

formed of the views of organized clubs, groups and associations who speak through registered lobbyists. Such views are often valuable, but they are no substitute for the frank opinions of thoughtful, interested individual citizens."

What, then, can be done about this bill which is already passed? As citizens, we of the Colorado amateur radio fraternity can do everything possible to express our "frank opinions" to the state senators and representatives with the hope that this portion of the law can be repealed.

If you're satisfied to "take it in the neck" and see your fellow amateurs do the same in this matter, you can sit back complacently and do nothing. On the other hand you can, in the same manner that PPRAA President Pete Demario reacted---get a letter off to the members of the General Assembly, informing them of the facts and eliciting their support in this matter. It's up to each and every one of you to help get something done.

A list of the senators and representatives from El Paso County to which your "protests" can be directed, in addition to the governor, appears in this issue of Zero Beat.

"Education" did it in Alaska--a program of "understanding" for the legislators may be the means of accomplishing it in Colorado.

---Frank, WØHWH

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 \* Members of the Colorado General As- \*  
 \* sembly from El Paso County are: \*  
 \* SENATORS \*  
 \* Kingston Minister \*  
 \* George Jackson \*  
 \* Norman Ohlson \*  
 \* REPRESENTATIVES \*  
 \* Mrs. Kay Munson \*  
 \* Harrie Hart \*  
 \* Charles Edmonds \*  
 \* Ted Schubert \*  
 \* Jim Braden \*  
 \* \*\*\*\*\*

## ALASKA IS APPRECIATIVE

(The following letter from Douglas L. Gregg, KL7FPA, Juneau, Alaska, is reprinted from June QST)

Both houses of the Alaska State Legislature have, by an overwhelming vote, passed House Bill No. 103 which relates to the annual license tax on vehicles containing mobile amateur radio stations. Under the new law, rather than pay \$30 for a license plate, an amateur holding an FCC license and with mobile capability of 75 meters through 10 meters, may obtain his license and his call letter license plates for a total fee of \$1.00

The idea behind the bill was to encourage amateur radio operators to equip for

(Continued on Page

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# PRESIDENT'S COLUMN

By Pete Demario, KØUDG

Greetings---

I guess you all got the same shock as I did when I opened my application for new ham plates for my car. After much fuming and fussing I finally settled down to the realization that persuasive action must be taken. The following letter was written to Governor John Love, State Senator Kingston G. Minister and Representative Mrs. Kay Munson:

Dear ---

I am writing you on behalf of the one hundred and twenty members of the Pikes Peak Radio Amateur Association, Inc., regarding the increased fee for amateur radio license plates. The measure, contained in House Bill 1469, 12-2123(6), raises the fee from \$1.00 to \$5.00 per year.

As you know, radio operators, and there are more than 3,000 in Colorado, are dedicated to public service. Many of us have several hundreds of dollars invested in equipment which we press into service along with our time and communicating skills wherever emergencies or disasters strike. These may be floods, fires, earthquakes or helping in the search for some lost child or passing words from a lonesome serviceman overseas to his loved one back home. We have performed these services gladly, and without compensation.

We do not ask that the state furnish the license free and the special plates for only a dollar as Alaska has recently done (Alaska House Bill 103), but we do feel that we should not be penalized for wishing to be readily identified by persons needing emergency communications.

We urge that you introduce a measure to repeal this discriminatory law which will discourage amateur operators from displaying their calls and quite probably from rendering a needed service.

Very truly yours,

About the only course of action we can take now is to let our representatives know how we feel about this new law. I strongly urge each of you to write a letter to one or all of the people responsible for making and passing the laws of our state and express your views.

Please see how many reasons you can give to get them to repeal this law.

73s, Pete, KØUDG

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## ALASKA IS APPRECIATIVE

(Continued from Page 3)

emergency use. You will recall that in the case of the Anchorage earthquake in 1964 and the Fairbanks flood of 1967, the power was off and regular communications were completely disrupted for a substantial period of time. In both cases radio amateurs provided an emergency link-up until power and normal communications were restored. In these days of zoning regulations which cramp amateur radio, TVI complaints and million dollar lawsuits, it is heartwarming to see the policy of a sovereign state of the Union recognizing the capabilities of the fraternity, and I think an appropriate article in your magazine might well be an eye-opener for other parts of the nation. Truly, the entire country should support the principle set forth in Alaska's House Bill No. 103 for no one is completely safe from natural disasters.

-o-o-o-o-

Don't miss Burt Bittner's talk on antennas at the September PPRAA meeting. You'll be sorry if you do!!!

### FOR SALE

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## ROSIE'S REPORTINGS

By Rosemarie Lewis, WAØMNL

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One of our newest members, James Don Carlos, WØITU, has had seven calls, among them in DL and FS categories. He was awarded first place in the 1968 British Amateur Radio Teleprinter Group Annual RTTY Contest. One of his calls was DL5PQ. He also has a WAC on RTTY.

-rr-

Congratulations to another of our newer members, Harlan Park, for getting his Advanced Class ticket.

-rr-

Bill Mueller, KØHFJ, is spending an exciting summer at Vandenberg AFB, in California, working on the space program.

-rr-

John Summers Jr., WØHHO, left for his second hitch in Vietnam after a visit in Colorado Springs, stopping on the way to visit with Bonnie and Larry Lewis in Livermore, California.

-rr-

Frank Crow, WØHWH, Zero Beat editor and our newest Board member, is combining his electronic and model railroading interests at the local model railroad club by designing and installing a 14 position selective intercom system, using power phones.

Might tell you a little about "wild life" at camp. A newborn fawn was found and some boys gave it lots of tender loving care, along with gin and milk to give it a boost. Gin-Gin lived two weeks but died from an infection from tooth marks in her neck where a wild animal had had her head in its mouth. The vet said probably a mountain lion or cat.

Also has a mother bear and two cubs visit the tent areas. The mother bear weighed about 250 pounds (someone said it was a black bear). She even ventured into one of the latrines and upset trash cans. I took a picture of her but had no directions with the camera as to how to take a steady picture while staring at a bear.

Lots of crows, birds, chipmunks, etc. No TV at camp but someone thought up a new game---it's "There's a delivery truck, go tell Rosie he clipped her antenna just to hear her holler."

During a thunderstorm had some lightning that came in on some wiring. Luckily I had the Swan 140 unplugged. Sparks sure flew from the plugins and the PA system at the camp.

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Start looking through your "junk box" and getting that unused stuff ready for the auction at the October PPRAA meeting---you don't need it---someone else may.

# CW

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## UNDERSTANDING TRANSISTORS

(The following article is reprinted from the Central California Radio Council's "Circle," which, in turn, obtained it from the publication of the Tulare County (Calif.) Amateur Radio Club. This is a series of lessons written by Jim White, ex-GM8KR, from Scotland, an associate member of mining, electronics and mechanical engineering in Great Britain, who holds California teaching credentials in Electronics and Professional Electronics Certification from the National Electronics Association of the U.S.A.

The entire series of lessons will be reprinted in this and future issues of Zero Beat. --- Editor)

By Jim White, Assoc. M.E.M.E.

The following lessons on transistors will enlighten newcomers to this field and refresh the memories of the old timers.

Ever since its invention in 1948, the transistor has steadily pushed its way into the lives of all engaged in the electronic industry. From its initial thrust forward in the radio industry it has spread its way into every branch of electronics. Today, transistors are used in thousands of industrial and military control systems, thousands are used as switching devices in telephone exchanges. Satellites contain as many as 3,000 transistors, medical electronics use them in such life-giving devices as pacemakers for the human heart.

The transistor has made history in so many ways in so short a time that the basic construction and workings have become taken for granted. We shall endeavor to bring to the fore the basics of this tiny wonder, THE TRANSISTOR.

SEMICONDUCTORS are located in the region between conductors and insulators, semi-conductor technology is usually referred to as SOLID-STATE. This suggests that the matter used in the fabrication of the various transistor devices are composed of a solid rather than a vacuum as found in our

tube technology. We must remember, however, that no matter is really solid but consists of many atoms and in the construction of the atom there is mostly space. Transistors and diodes are made of semi-conductor materials. These materials are called semiconductor because their resistivity lies between that of conducting metals and non-conducting insulating materials.

(See chart on following page)

## LESSON 1

The actual physics of solid state operation is necessary for a thorough understanding of transistor function, therefore we must start with the basic transistor materials, namely Germanium and Silicon. Both of these materials have one thing in common, that is they contain in their basic atomic construction four electrons in their outer orbit. This outer orbit is called the valence band, from the Latin root valere (to be strong). It is the electrons in this band that we use in our transistor physics. When an electron is freed or forced from its valence band and moves into outer atomic space it becomes a current carrier and possess the ability to move back and forth between atoms of the basic material.

Most atoms possess the ability to unite with other atoms and such an atom is said to be a valent atom. The electrons from the valence band of one atom can move into the valence band of another atom, this movement of valence electrons can therefore can combine or encompass two atoms and this action also occurs in neighboring atoms and this combining process continues in the material as a whole and is known as a covalent band. Thus when two atoms share valence electronics they are said to be covalent.

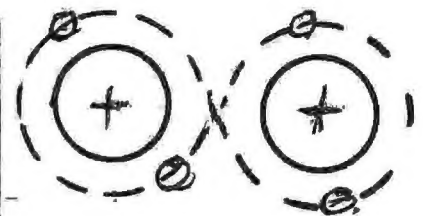
In the next lesson we shall cover crystal lattice structure in a single crystal of pure germanium and silicon.

(Lesson 2 will appear next month)

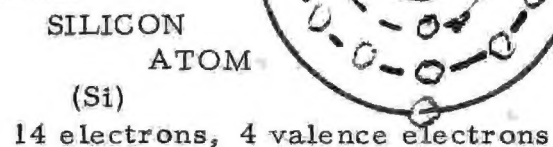
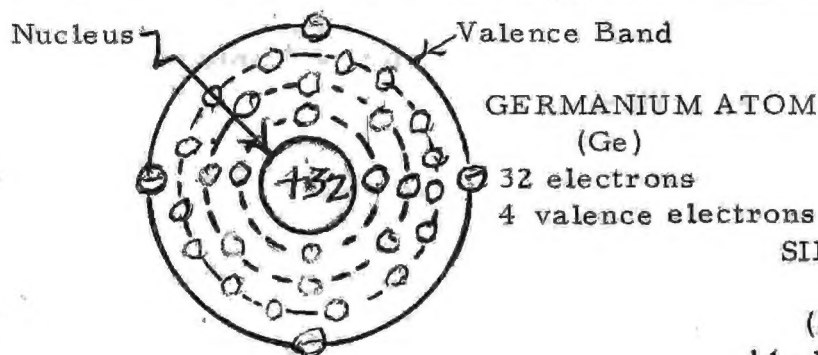


# TRANSISTOR LESSON CHART

Material	Resistance in ohms per centimeter cube	Category
Silver	$10^{-6}$	Conductor
Aluminum	$10^{-5}$	
Pure Germanium	50-60	Semi-conductor
Pure Silicon	50,000-60,000	
Mica	$10^{12}$ - $10^{13}$	Insulator
Polyethylene	$10^{18}$ - $10^{16}$	



Shared orbit  
COVALENT OR PAIR  
BAND OF ATOMS



\*\*\*\*\*  
\* SILENT KEY \*  
\*\*\*\*\*

\* Mrs. Caroline (Carol) Schisler, \*  
\* WØEVT, XYL of Clare (Butch) Schisler \*  
\* WØBGX, passed away 3 July. \*

\* Carol was born in Austria and had \*  
\* been a local resident for 60 years. She \*  
\* was active in all radio clubs, including \*  
\* the PPRAA, and was the first woman \*  
\* in Colorado to obtain an amateur radio \*  
\* license. \*

\* Carol was in contact with Pearl Har- \*  
\* bor at the time of the attack. She was \*  
\* always ready and willing to help when \*  
\* needed and used her fone patch to pro- \*  
\* vide a link for many people. \*

\* Amateur radio operators were pall \*  
\* bearers for the funeral and the PPRAA \*  
\* sent flowers. \*

\*\*\*\*\*

Don't forget to let the legislators know  
how you feel about the increase they have  
boted for call letter plates.

## LOCAL MODEL RAILROAD CLUB TO HOLD OPEN HOUSE THIS MONTH

Persons who miss the trains which  
used to run through Colorado Springs will  
have an opportunity to see them running  
again---at least "in miniature" at the open  
house of the Central Colorado Model Rail-  
road Club in the Santa Fe depot the last  
week end in August.

The club and model railroad layout  
will be in operation and open to the public  
from 7 to 11 p.m. Friday, August 22, 10  
a.m. to 10 p.m. Saturday, August 23 and  
noon to 5 p.m. Sunday, August 24.

No admission will be charged but don-  
ations to the club operating fund will be  
accepted.

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Imagine a transistor radio with battery  
built into the transistors themselves---- and  
lasting the life of the equipment. A part of  
the possibilities for a new radioactive dev-  
ice called the ELECTRISTOR.

(From "The Open Mike" in the Denver radio Club "Round Table" of June 1969)

Gene McFadden, WAØUUK, wrote quite a letter about his trials and tribulations in trying to obtain a "legal" phone patch from Ma Bell.

"Phone patches are handled through marketing and the guy's name is Mike Bonfiglio, telephone number is 266-8670, which is his direct line. Naturally I found this out after I went to the phone company office. Mike looked up "interconnecting devices" in the book of tariffs and this applies only to a phone patch that the amateur already has, rather than one furnished by the phone company and its official designation is a "QKT," whatever that means. This is what you

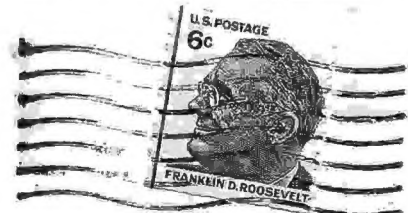
should ask for.

"A special phone is installed, dial type of course, with one of the buttons being white instead of clear. The matching network is inside the phone itself, not as pictured in QST, where the phone looks different. There is a 'voice coupler' and still another jack. The amateur's patch will hook to this special phone and that's all there is to it. There is an installation charge of \$7.50 and an additional charge of 50¢ per month for the coupler. If you do not already have an extension you will have to pay for one for the couple . . ."

There is quite a bit more but this gives you an idea of the new tariffs for a phone patch.

ZERO BEAT EDITOR

Pikes Peak Radio Amateur Assn., Inc.  
1142 Rainier Drive  
Colorado Springs, Colo. 80910



Eldon Lewis  
2018 W. Uintah  
Colo. Springs 80904